CSC110 Fall 2021: Mock Test, Question 1

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Predicate logic

Consider the following domain. Let M be a set of movies, and suppose we define the following predicates:

- $SciFi(m)$: "m is a science fiction movie", where $m \in M$

- $HighlyRated(m)$: "m is highly rated (has an average rating on IMDB of at least 8/10)", where $m \in M$.

(a) First, translate each of the following statements into English:

    1. $\forall m \in M, \ SciFi(m) \wedge HighlyRated(m)$

> All the movies in the set are science fiction and highly rated.

    2. $\forall m \in M, \ SciFi(m) \Rightarrow HighlyRated(m)$

> If a movie within the set is science fiction, then it much also be highly rated.

    3. $\forall m \in M, \ HighlyRated(m) \Rightarrow SciFi(m)$

> If a movie within the set is highly rated, then it must also be science fiction.

(b) In the space below, we've started a table (Table 1) that represents a possible state for a set M that contains four movies But one row is missing. Fill in the row to make all three of the statements from part (a) **True**.

Table 1: A possible state for a set M that contains four movies.

Movie	Science fiction?	Score on IMDb
1	Yes	9.5
2	Yes	8.5
3	Yes	10.0
4	Yes	8.0